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Alessandro Garassino* & Antonio De Angeli**

Parthenope angulifrons Latreille, 1825, and *Atelecyclus rotundatus* (Olivi, 1782) from the Sicilian (upper Pleistocene) of Favignana Island (Egadi Islands, Sicily, S Italy)

Abstract – We describe two specimens of brachyurans, discovered in the upper Pleistocene of Punta Marsala and along the coast between Grotta Perciata and Punta Fanfalo (Favignana Island, Egadi Islands, Sicily). The study of these well-preserved three-dimensional specimens allowed to ascribe them to the living Mediterranean species, *Parthenope angulifrons* Latreille, 1825 (family Parthenopidae MacLeay, 1838) and *Atelecyclus rotundatus* (Olivi, 1782) (family Atelecyclidae Ortmann, 1893). The discovery of these two species from the Pleistocene deposits of Favignana Island is important because enlarges the carcinologic knowledge of Sicilian (upper Pleistocene) of S Italy.

Key words: Crustacea, Decapoda, Pleistocene, S Italy.

Riassunto – *Parthenope angulifrons* Latreille, 1825, e *Atelecyclus rotundatus* (Olivi, 1782) nel Siciliano (Pleistocene superiore) dell'Isola di Favignana (Isole Egadi, Sicilia, S Italia).

Descriviamo due esemplari di crostacei brachiuri, rinvenuti nel Pleistocene superiore della località di Punta Marsala e lungo il litorale tra Grotta Perciata e Punta Fanfalo (Isola di Favignana, Isole Egadi, Sicilia). Lo studio di questi esemplari conservati tridimensionalmente ha permesso di attribuirli alle due specie attualmente viventi nel Mediterraneo, *Parthenope angulifrons* Latreille, 1825 (famiglia Parthenopidae MacLeay, 1838) e *Atelecyclus rotundatus* (Olivi, 1782) (famiglia Atelecyclidae Ortmann, 1893). La scoperta di queste due specie nei depositi Pleistocenici dell'Isola di Favignana è importante in quanto amplia le conoscenze carcinologiche del piano Siciliano (Pleistocene superiore) dell'Italia meridionale.

Parole chiave: Crustacea, Decapoda, Pleistocene, S Italia.

Introduction

The studied specimens were collected by E. Borghi in Favignana Island some years ago (2001). The Pleistocene levels, from which the specimens were collected, are located E of the dotted line that starts W of the port (Fig 1). This area of the island is flat and elevated only slightly above sea level. The studied specimens were discovered in two different localities, both more or less 3-4 m above sea level. The first one, *Parthenope angulifrons* Latreille, 1825, comes from the coast between

*Department of Invertebrate Palaeontology, Museo Civico di Storia Naturale, Corso Venezia 55, 20121 Milano, Italy, e-mail: a.garassino@tin.it

**Associazione Amici del Museo Zannato, Piazza Marconi 15, 36075 Montecchio Maggiore (Vicenza), Italy, e-mail: antonio_deangeli@virgilio.it

Grotta Perciata and Punta Fanfalo, while the second, *Atelecyclus rotundatus* (Olivi, 1782), comes from the coast close to the lighthouse of Punta Marsala (Fig. 1). The fauna associated with the brachyurans, usually brachiopods and echinoderms, is similar in both localities. The study of some of the species, such as *Spatangus purpureus*, *Paracentrotus lividus*, *Tetebratula scillae* and *Echinocardium mortenseni*, by Kohler (1927), Tortonese (1965), Peres & Picard (1966), Gaetani & Saccà (1984), and Taddei Ruggiero (1994), established a Sicilian age (upper Pleistocene) for the fossiliferous levels. This dating is also confirmed by the geological studies by Gemmellaro (1919), Jacobacci (1955), Malatesta (1957), and recently Agnesi *et al.* (1993).

Fig. 1 - Favigana Island (Egadi Islands, Trapani). The asterisks show the localities where the studied specimens were discovered. *Parthenope angulifrons* Latreille, 1825, comes from locality 1 and *Atelecyclus rotundatus* (Olivi, 1792) from locality 2.
Fig. 1 - Isola di Favignana (Isole Egadi, Trapani). Gli asterischi indicano le località di rinvenimento degli esemplari studiati. *Parthenope angulifrons* Latreille, 1825 proviene dalla località 1 e *Atelecyclus rotundatus* (Olivi, 1792) dalla località 2.

The previous studies of the decapod crustaceans from Pleistocene of Sicily

Even though the reports of well-preserved decapods, usually fragments of carapaces and chelae, from the post-Pliocene levels of Sicily (S Italy) are frequent, only a few authors have carried on extensive studies.

The presence of some chelae discovered in the sediments of Monte Pellegrino in Sicily (S Italy) was reported by A. Milne Edwards (1861). These chelae were ascribed to the following species: *Maja squinado* (Herbst, 1788), *Goneplax rhomboides* (Linnaeus, 1758), *Ilia nucleus* (Linnaeus, 1758), *Calappa granulata* (Linnaeus, 1767), and *Xantho floridus* (Montagu, 1813).

Ristori (1886) reported the presence of *Cancer Sismondae* Meyer, 1843, and *Pilumnus spinosus* Ristori, 1886 (today *Cancer spinosus* (Ristori, 1886)) from the Astian (upper Pliocene) of Tremonte, *Hepatinulus Seguentiae* Ristori, 1886, from Scoppo and S. Filippo (Trapani) and *Galathea affinis* Ristori, 1886, from the Astian of Bianchi.

Checchia-Rispoli (1903) described a well-preserved carapace of *Xantho floridus* Montagu, 1813 (today *Xantho incisus* (Leach, 1814)) from the post-Pliocene tufa of Vergine Maria village near Palermo (Sicily).

Checchia-Rispoli (1905) reported the presence of *Atelecyclus rotundatus* (Olivi, 1792) from the post-Pliocene tufa of Ficarazzi village (Palermo).

Gemmellaro (1914) described a rich decapod fauna from the tufa around Palermo with the following species: *Dromia vulgaris* H. Milne Edwards, 1837 (today *D. personata* (Linnaeus, 1759)), *Dorippe lanata* (Linnaeus, 1766), *Ebalia Cranchii* (Leach) var. *romana* Ristori, 1891, *Ebalia Pennanti* Leach, 1815 (today *E. tuberosa* (Pennant, 1777)), *Calappa granulata* (Linnaeus, 1758), *Maja squinado* (Herbst, 1788), *Maja squinado* (Herbst) var. *Di-stefanoi* Gemmellaro, 1914, *Pisa Gibbsi* Leach, 1815 (today *P. armata* (Latreille, 1803)), *Lambrus* sp. (today *Parthenope* sp.), *Xantho florida* (Montagu, 1813) (today *X. incisus* (Leach, 1814)), *Pilumnus villosus* Risso, 1826, *Eriphia spinifrons* (Herbst, 1782) (today *E. verrucosa* (Forskål, 1775)), *Portunus tuberculatus* Roux, 1828 (today *Macropipus tuberculatus* (Roux, 1828)), *Atelecyclus rotundatus* (Olivi) var. *Checchiai* Gemmellaro, 1914, *Goneplax* cfr. *rhomboides* (Linnaeus, 1758), *Pachygrapsus marmoratus* (Fabricius, 1787), *Pagurus* sp., *Gebia* cfr. *stellata* Leach, 1815 (today *Upogebia* cfr. *stellata* Leach, 1815) and *Callianassa subterranea* (Montagu) var. *dentata* Ristori, 1891.

Material

The studied specimens are three-dimensionally preserved and the preparation is easy due to the soft consistency of the surrounding rock. The study of the two specimens, housed in the palaeontological collection of Museo Civico di Storia Naturale di Milano, permitted identification of two living species, *Parthenope angulifrons* Latreille, 1825 (family Parthenopidae MacLeay, 1838) and *Atelecyclus rotundatus* (Olivi, 1782) (family Atelecyclidae Ortmann, 1893).

The systematic palaeontology used in this paper follows the recent classification proposed by Martin & Davis (2001).

Acronym. MSNM: Museo Civico di Storia Naturale di Milano

Systematic Palaeontology

Order Decapoda Latreille, 1802
Infraorder Brachyura Latreille, 1802
Section Eubrachyura de Saint Laurent, 1980
Subsection Heterotremata Guinot, 1977
Superfamily Parthenopoidea MacLeay, 1838
Family Parthenopidae MacLeay, 1838
Genus *Parthenope* Weber, 1795

Type-species: *Cancer longimanus* Linnaeus, 1758

Parthenope angulifrons Latreille, 1825
Figs. 2, 4

1825 *Parthenope angulifrons* – Latreille, p. 46
1863 *Lambrus angulifrons* – Heller, p. 57, Pl. 2
1918 *Lambrus angulifrons* – Pesta, p. 371, Fig. 119
1931 *Lambrus angulifrons* – Nobre, p. 140, Figs. 80-81
1940 *Lambrus angulifrons* – Bouvier, p. 310, Fig. 191, Pl. 12 (Fig. 1)
1941 *Lambrus angulifrons* – Zariquiey Cenarro, p. 351, 365, Figs. 36-44 a-c
1946 *Lambrus angulifrons* – Zariquiey Alvarez, p. 167, Pl. 20
1968 *Parthenope angulifrons* – Zariquiey Alvarez, p. 439, Fig. 148b
1992 *Parthenope angulifrons* – Falciai & Minervini, p. 242

Occurrence and measurements: we ascribe to this species one specimen (MSNM i26283) from the Sicilian (upper Pleistocene), discovered along the coast between Grotta Perciata and Punta Fanfalo of the Favignana Island (Egadi, Islands, Sicily, S Italy).

The sizes are expressed in millimetres.

W1=23; W2=11.3

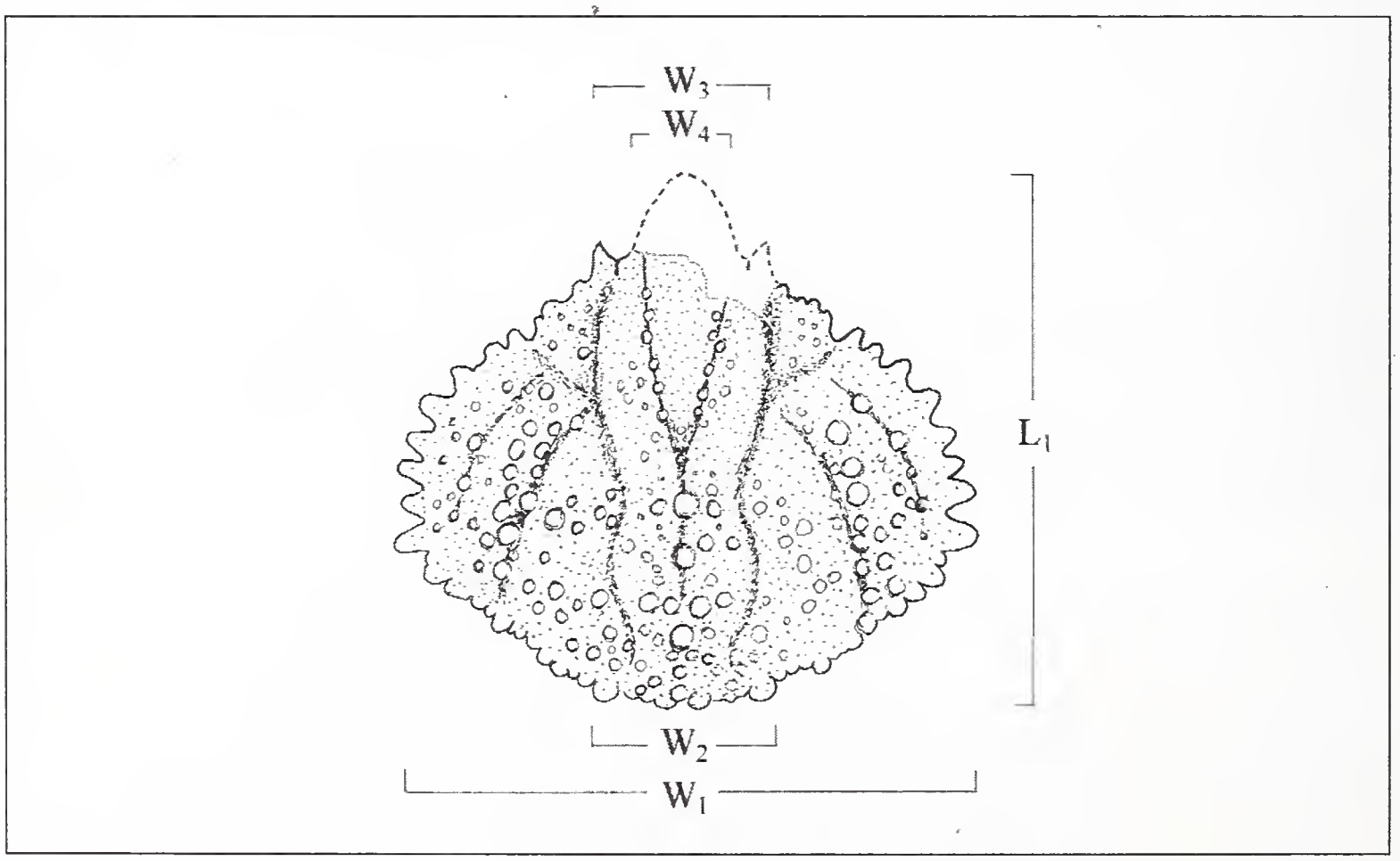

Fig. 2 - *Parthenope angulifrons* Latreille, 1825. Sketch of the carapace and examined sizes: W1=maximum width of the carapace; W2=width of the posterior margin; W3=frontal-orbital width; W4=width of the front; L1= maximum length of the carapace.

Fig. 2 - *Parthenope angulifrons* Latreille, 1825. Schema del carapace e misure considerate: W1=massima larghezza del carapace; W2=larghezza del margine posteriore; W3=larghezza fronto-orbitale; W4=larghezza della fronte; L1= lunghezza massima del carapace.

Discussion. The studied specimen shows the following morphological characters: subtriangular carapace, as long as wide; incomplete frontal margin distally; subcircular orbits; raised supraorbital margins with narrow and long fissure; triangular extraorbital tooth; convex and tuberculate lateral margins; tubercles well developed along branchial regions with small dorsal granulations; anterior dorsal part of dorsal surface with two granulate longitudinal ridges joining on metagastric regions to make a "V"; frontal region lowered in the median part; well developed and convex gastric, branchial, and cardiac regions all with granulations; branchial regions with two oblique rows of tubercles.

The studied specimen shows the typical morphological characters of the living species *Parthenope angulifrons* Latreille, 1825. We noted some moderate variations in the number or disposition or sizes of the tubercles on dorsal surface and lateral margins of the fossil specimen by a comparison with some specimens caught along the Italian northern coasts (Fig. 4b). However, these variations are also present among the examined living specimens.

This species lives at a depth between 2-80 metres (usually between 10-40 metres) in the Mediterranean Sea and Southwestern Spain.

Superfamily Cancroidea Latreille, 1802
Family Atelecyclidae Ortmann, 1893
Genus *Atelecyclus* Leach, 1814

Type-species: *Cancer rotundatus* Olivi, 1792

Atelecyclus rotundatus (Olivi, 1792)
Figs. 3, 5

1792 *Cancer rotundatus* - Olivi, p. 47, Pl. 2 (Fig. 2)
1813 *Cancer Hippa septemdentatus* – Montagu, p. 1, Pl. 1 (Fig. 1)
1815 *Atelecyclus heterodon* - Leach, p. 2, Figs. 1-2
1863 *Atelecyclus heterodon* - Heller, p. 133
1888 *Atelecyclus heterodon* - Gourret, p. 55, Pl. 1 (Figs. 1-17)
1905 *Atelecyclus rotundatus* - Checchia-Rispoli, p. 86-98, Fig. 1
1914 *Atelecyclus rotundatus* var. *checchiai* - Gemmellaro, p. 89, Pl. 1 (Figs. 24-25)
1918 *Atelecyclus rotundatus* - Pesta, p. 382, Fig. 122
1936 *Atelecyclus heterodon* - Nobre, p. 25, Pl. 8 (Fig. 14)
1928 *Atelecyclus septemdentatus* - Lebour, p. 524, Fig. 1(5), Fig. 4(24, 26, 27), Fig. 5(13, 14), Pl. 2 (Fig. 2), Pl. 9 (Figs. 1-6), Pl. 10 (Figs. 1-2)
1940 *Atelecyclus septemdentatus* - Bouvier, p. 219, Fig. 148, Pl. 8 (Fig. 6)
1946 *Atelecyclus septemdentatus* - Zariquiey Alvarez, p. 149, Pl. 10 (Figs. d-e)
1956 *Atelecyclus septemdentatus* - Monod, p. 148
1957 *Atelecyclus rotundatus* - Forest, p. 472

1967 *Atelecyclus rotundatus* - Allen, p. 29, 68, 102
1968 *Atelecyclus rotundatus* - Zariquiey Alvarez, p. 342, Fig. 112b
1969 *Atelecyclus rotundatus* - Christiansen, p. 37, Fig. 13a
1976 *Atelecyclus rotundatus* - Turkey, p. 37
1980 *Atelecyclus rotundatus* - Ingle, p. 103, Fig. 46, Pl. 14a
1992 *Atelecyclus rotundatus* - Falciai & Minervini, p. 196

Occurrence and measurements: we ascribe to this species one specimen (MSNM i26282) from the Sicilian (upper Pleistocene), discovered along the coast close to the lighthouse of Punta Marsala of the Favignana Island (Egadi Islands, Sicily, S Italy).

The sizes are expressed in millimetres.

W1=22.4; W2=9.4; W3=11.5; W4=4.7; L1=<21.5

Discussion. The studied specimen shows the following morphological characters: subcircular carapace, as long as wide, slightly convex on the surface; dentate fronto-orbital margin, as long as half maximum width of carapace; front with three

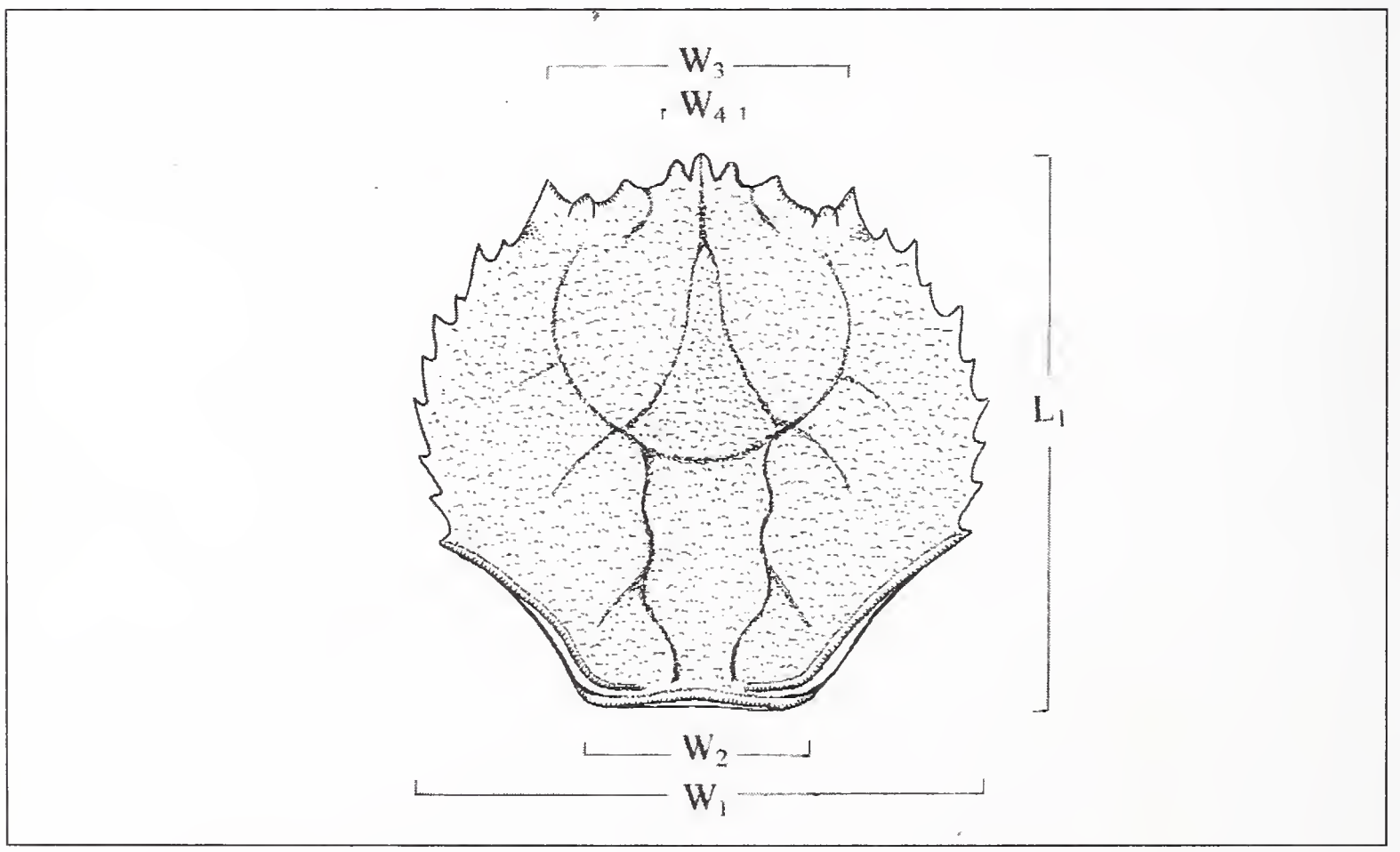

Fig. 3 - *Atelecyclus rotundatus* (Olivi, 1792). Sketch of the carapace and examined sizes: W1=maximum width of the carapace; W2=width of the posterior margin; W3=frontal-orbital width; W4=width of the front; L1= maximum length of the carapace.
Fig. 3 - *Atelecyclus rotundatus* (Olivi, 1792). Schema del carapace e misure considerate: W1=massima larghezza del carapace; W2=larghezza del margine posteriore; W3=larghezza fronto-orbitale; W4=larghezza della fronte; L1= lunghezza massima del carapace.

teeth of which left and middle are incomplete; wide orbits with two supraorbital fissures; convex anterolateral margins with nine triangular spines of different size protruded forwards; posterolateral margin shorter and convex; granulate carina extends along the entire posterolateral margin, starting from the last anterolateral spine to the posterior angle; narrow posterior margin with a dorsal granulate ridge; well developed dorsal regions marked by weak grooves and with small tubercles; tubercles are arrayed in short transverse rows in median and posterior regions.

The studied specimen shows morphological characters almost similar to *Atelecyclus rotundatus* (Olivi, 1792). The fossil carapace was also compared with a living specimen caught along the coast of Ravenna (Fig. 5b).

The presence of *Atelecyclus rotundatus* (Olivi, 1792) from the Pleistocene levels of Sicily was already known from a carapace, discovered in the tufa of Ficarazzi village (Palermo) and reported by Checchia-Rispoli (1905). Later, Gemmellaro (1914) described *Atelecyclus rotundatus* var. *checchiai* based upon the morphological characters of another specimen, discovered in a quarry of Monte Pellegrino (Palermo). The author reported on this specimen the presence of nine anterolateral spines, typical of this species, distinguishing it from those with seven and nine spines. However, Gemmellaro identified incorrectly the lateral spines starting from the posterior. Therefore, the reported spines belong to the first and third, excluding the extraorbital spine as it is possible to observe in his table (Pl. 1 – Figs 24-25). The ascription of Gemmellaro's specimen to a variety is therefore unnecessary because the anterolateral spines of *Atelecyclus rotundatus* (Olivi, 1792) are usually of different sizes.

This species lives at a depth between 20-90 metres in Atlantic Ocean, along the coast of Great Britain, Norway and Portugal and in the Mediterranean Sea. Bouvier (1940) reported this species also at a depth of 748 metres.

Conclusions

The presence of decapod crustaceans from the Sicilian (upper Pleistocene) is uncommon, as reported by Gemmellaro (1914). The sample used by the author came from the palaeontological collection of Museo Geologico di Palermo and from the private collection of Marchese di Monterosato. The identified fossil species are all present in the Mediterranean Sea or along the European coasts of the Atlantic. Surely some fossil species described by Gemmellaro and identified as varieties, need an extensive review, taking into consideration the intraspecific variability of every species and the lost of some morphological characters during the fossilization.

The discovery of *Parthenope angulifrons* Latreille, 1825, and *Atelecyclus rotundatus* (Olivi, 1792) from the Pleistocene deposits of Favignana Island is very important because enlarges the carcinologic knowledge of Sicilian (upper Pleistocene) of S Italy.

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References

Agnesi V., Macaluso T., Orrù P. & Ulzega A., 1993 – Paleogeografia dell'Arcipelago delle Egadi (Sicilia) nel Pleistocene Sup.-Olocene. *Naturalista siciliano*, Palermo, serie 4, 17 (1-2): 3-22.

Bouvier E.-L., 1940 – Faune de France. 37. Décapodes Marcheurs. *Official Central de Faunistique*, Paris.

Checchia-Rispoli G., 1903 – Sopra un crostaceo dei tufi post-pliocenici dei dintorni di Palermo. *Bollettino della Società Geologica Italiana*, Roma, 22: 488-492.

Checchia-Rispoli G., 1905 – L'*Atelecyclus rotundatus* Ol. fossile nel postpliocene dei dintorni di Palermo. *Naturalista Siciliano*, Palermo, n. ser., 18 (1906): 86-98.

Gaetani M. & Saccà D., 1984 – Brachiopodi neogenici e pleistocenici della provincia di Messina e della Calabria meridionale. *Geologica Romana*, Roma, 22.

Gemmellaro M., 1914 – Crostacei e pesci fossili del "Piano Siciliano" dei dintorni di Palermo. *Giornale di Scienze Naturali ed Economiche di Palermo*, Palermo, 30: 73-113.

Gemmellaro G., 1919 – Osservazioni sul Quaternario dell'isola di Favignana. *Bollettino Società Scienze Naturali ed Economiche di Palermo*, Palermo.

Kohler R., 1927 – Les Echinodermes des mers d'Europe. *Librairie Doin èditor*, Paris.

Jacobacci A., 1955 – Primi risultati dei rilevamenti geologici effettuati durante l'anno 1954. *Bollettino Servizio Geologico Italiano*, Roma, 76(2): 491-495.

Malatesta A., 1957 – Terreni, faune e industrie quaternarie nell'Arcipelago delle Egadi. *Quaternaria*, Roma, 4: 165-257.

Martin J.W. & Davis G.E., 2001 – An Updated Classification of the Recent Crustacea. *Natural History Museum of Los Angeles County*, Science series, Los Angeles, 39: 1-124.

Milne Edwards A., 1861 – Remarques sur la faune carcinologique des terrains quaternaries. *L'Institut, Journal des Sciences et des Societés savants en France*, Paris.

Peres J.M. & Picard J., 1966 – Noveau manula de Bionomie Benhique de la Mar Mediterranée. Paris.

Ristori G., 1886 – I crostacei brachiuri e anomuri del Pliocene italiano. *Bollettino Società Geologica Italiana*, Roma, 5: 93-128.

Taddei Ruggiero E., 1994 – Neogene Salento brachiopodi paleocommunities. *Bollettino Società Paleontologica Italiana*, Modena, 33(2): 197-213.

Tortonese E., 1965 – Fauna d'Italia. Echinodermata. *Calderini*, Bologna.

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Fig. 4 - *Parthenope angulifrons* Latreille, 1825. a) MSNM i26283, Pleistocene of Favignana Island; b) living specimen, discovered at Celle Ligure (Savona).
Fig. 4 - *Parthenope angulifrons* Latreille, 1825. a) MSNM i26283, Pleistocene dell'Isola di Favignana; b) esemplare vivente, rinvenuto a Celle Ligure (Savona).

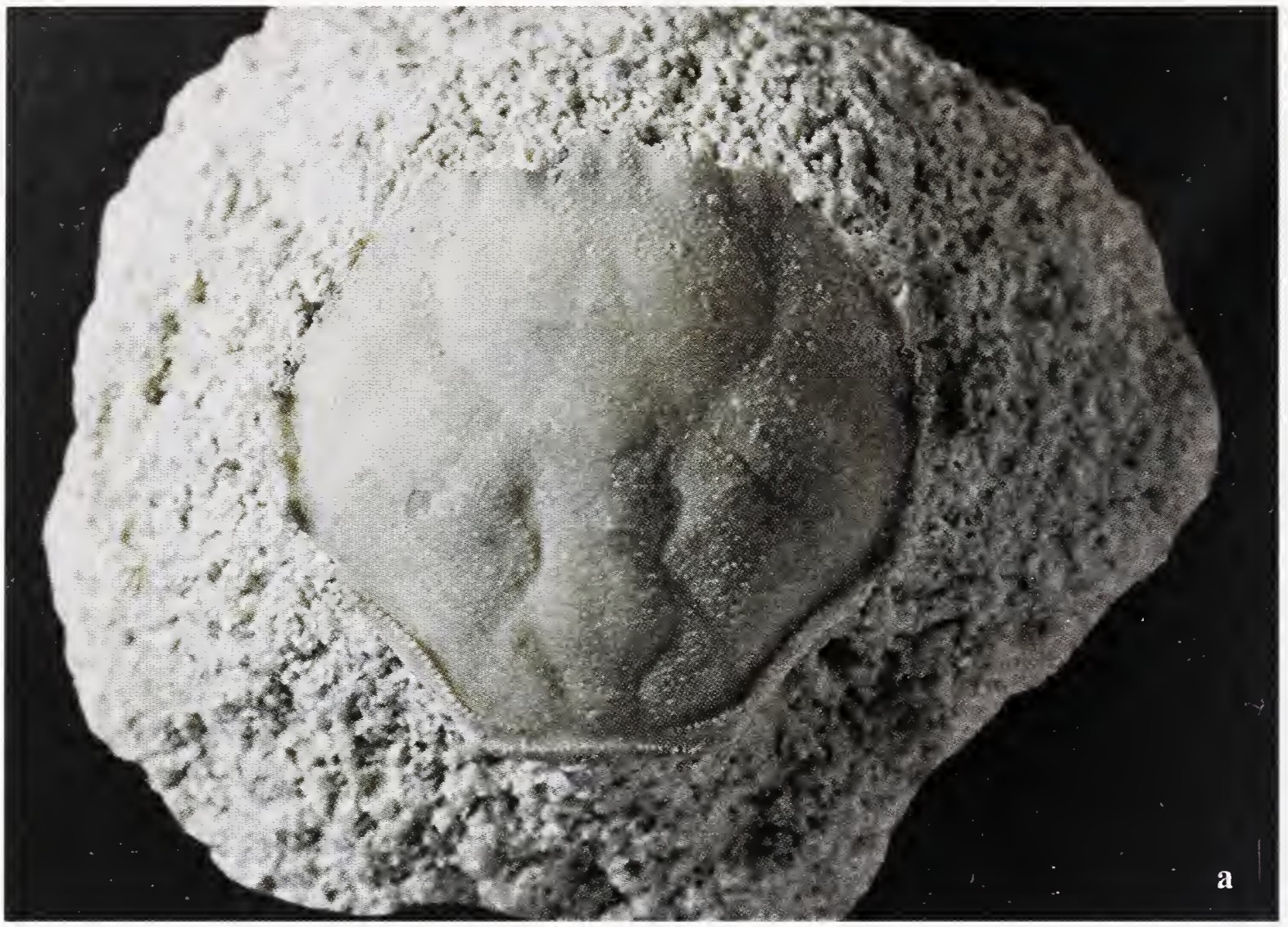

Fig. 5 - *Atelecyclus rotundatus* (Olivi, 1792). a) MSNM i26282, Pleistocene of Favignana Island; b) living specimen, fished along the coastline of Ravenna at a depth of 40 metres.
Fig. 5 - *Atelecyclus rotundatus* (Olivi, 1792). a) MSNM i26282, Pleistocene dell'Isola di Favignana; b) esemplare vivente, pescato lungo le coste di Ravenna ad una profondità di 40 metri.